ADEMCO

USER'S MANUAL — No. 7915 Field Alarm Signal Tester

INTRODUCTION

The No. 7915 Field Alarm Signal Tester (FAST Tool) is a portable, battery operated RF signal receiving/analyzing device primarily used to identify the best possible antenna locations for subscriber radios provided as part of an the Ademco Long Range Radio Security System. It can also be used as a salesman's demonstration tool, and for verifying the suitability of a customer's site for radio use. The FAST Tool provides direct, visual indication of real-time field strength and frequency measurements from network radio signals, using easy-to-read LED bar graphs, and includes a built-in speaker for listening to modulated data signals. Since the proper placement of the subscriber antenna is critical in achieving a dependable communication link with the security network, installers should use the No. 7915 FAST Tool at all Long Range Radio subscriber installations.

CONTROLS

POWER ON SWITCH

This toggle switch applies power to the No. 7915. The FAST Tool can operate continuously for up to 3 hours using its built-in battery, and includes a transformer for recharging the battery. If desired, the FAST Tool can operate with transformer power, but note that the line cord limits freedom of movement. The FAST Tool automatically turns itself off after seven minutes. To reactivate, turn the POWER switch off, then on again.

BATT(ERY) TEST BUTTON

This pushbutton switch is used to display the condition of the internal, rechargeable battery. When depressed, the horizontal FREQUENCY/BATTERY bar graph indicates the condition of the battery. The lighted segment should be within the bracketed area marked "GOOD". Use the supplied transformer to charge the battery if the lighted segment is within the "RECHARGE" bracketed area.

VOLUME CONTROL

The FAST Tool includes a built-in speaker for listening to modulated data signals, referred to in this document as "bleeps". With practice, these sounds become very distinguishable, thus aiding in the quick identification of suitable antenna mounting locations. The VOLUME control is used to adjust the speaker volume. Rotate clockwise to increase volume, counterclockwise to decrease the volume. Refer to the USING THE FAST TOOL section for more information regarding sound.

CHANNEL DIP SWITCH

The FAST Tool can be set to receive any of the 14 Long Range Radio communication channels via a seven position DIP switch. To set the No. 7915 to the proper channel, refer to the "USING THE FAST TOOL" section of this document.

RANGE SWITCH

This switch is used to set the LED segments of the SIGNAL STRENGTH bar graph in either coarse or fine increments. The HIGH (coarse) range position measures field strength in steps of approximately 8dB per LED segment, and is used to identify sites that provide strong communication paths to the network. The LOW (fine) range measures in steps of approximately 4dB per LED segment and is used to determine antenna mounting locations in weaker signal environments. Refer to the USING THE FAST TOOL section for additional information regarding acceptable values when determining antenna locations.

DISPLAYS

SIGNAL STRENGTH DISPLAY

The vertical SIGNAL STRENGTH bar graph display provides quick, visual indication of the strength of local RF activity, allowing the installer to easily determine suitable subscriber antenna locations. The Signal Strength display represents the relative field strength of received RF signals and is calibrated in dBm. Depending on the RANGE switch setting (see RANGE SWITCH), each segment of the bar graph indicates approximately either an 8dB (HIGH position) or 4dB (LOW position) increase in signal level. Signal Strength is also measured on a numerical scale from 1 to 10, with 10 representing the highest signal strength in the selected range. Due to the sensitivity of the FAST Tool, ambient radio "noise" will usually light segment [1] of the bar graph. In addition, signals on adjacent channels can also light the display. *Note that "on channel" signals will light the centermost segments of the FREQUENCY bar graph and that only these signals should be used when determining good antenna locations (refer to the FREQUENCY DISPLAY paragraph for more information).*

FREQUENCY/BATTERY DISPLAY

The horizontal bar graph display serves two purposes: Frequency offset measurement and battery condition.

Normally, this bar graph visually indicates the frequency offset of received signals, and is used to distinguish "on channel" signals from other spurious signals. "On channel" signals will light a cluster of center segments, while spurious signals will light the segments at either end of the bar graph. The leftmost segments represent signals that are at a lower frequency than the programmed channel, while the rightmost segments represent higher frequency signals. Since an FM transmission scheme is used by the Ademco Long Range Radio network, the actual number of segments lighted will vary according to the data modulation of each transmission, with each segment representing about 1kHz deviation. Typical network signals have approximately ±3kHz deviation. In addition, the FAST Tool will audibly indicate "on channel" data signals with "bleeps".

The battery condition can also be displayed on this bar graph by depressing the BATT TEST button. The lit LED segment should be within the bracketed area marked "GOOD". If not, the battery should be charged before using the FAST Tool. Refer to the USING THE FAST TOOL section for recharging instructions.

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USING THE FAST TOOL TO SELECT AN ANTENNA SITE

Before installing a subscriber radio antenna, the installer must first verify that the mounting location allows a strong communication link with the Long Range Radio Security Network. Optimum locations are determined by observing the FAST Tool bar graph displays while moving from site to site. The following steps describe the procedures to take:

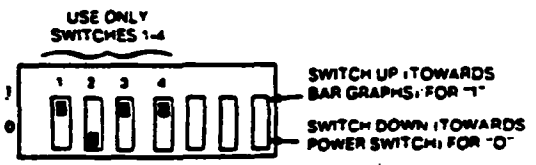
1. **Prepare the Subscriber Radio** in accordance with its installation instructions, including all wiring and programming. If the subscriber antenna is being mounted remotely, the Radio chassis can be mounted at this time. Be sure to review the GENERAL NOTES ON RADIO INSTALLATION section later in this document for important installation considerations.

2. **Connect the FAST Tool antenna** to the Antenna connector by aligning the slots in the antenna's connector with the tabs in the receptacle, pushing downward and rotating clockwise. To remove the antenna, apply slight downward pressure while twisting counter-clockwise, then lift the antenna off the connector.

3. **Set the FAST Tool to the proper operating channel** by placing the first four switches in the CHANNEL DIP switch to the proper position (0 or 1) according to the following table (switches 5-7 can be disregarded):

CH.	POSITIONS 1	2	3	4	CH.	POSITIONS 1	2	3	4
1	1	0	0	0	8	0	0	0	1
2	0	1	0	0	9	1	0	0	1
3	1	1	0	0	10	0	1	0	1
4	0	0	1	0	11	1	1	0	1
5	1	0	1	0	12	0	0	1	1
6	0	1	1	0	13	1	0	1	1
7	1	1	1	0	14	0	1	1	1

Ex. To set channel 13, set switch one to the "1" position, switch two to the "0" position, and switches three and four to the "1" position as shown below:



SHOWN SET FOR CHANNEL 13

Note that once a channel has been set, the FAST Tool will be tuned to that channel upon power up. Should a different channel be desired, simply reset the DIP switches for the new channel while the FAST Tool is off.

4. **Turn the FAST Tool on** by moving the POWER toggle switch to the up position. The unit will automatically turn itself off after seven minutes. To turn the FAST Tool on for another 7 minutes, simply turn the POWER switch off, then on again.

***IMPORTANT!:** To insure proper FAST Tool operation, always check the battery condition before each use by depressing the "BATT TEST" pushbutton and observing the horizontal FREQUENCY/BATTERY display. The bar graph should be lit within the bracketed area marked "GOOD". If not, the battery should be recharged before using the FAST Tool.*

When the FAST Tool is activated, the lighted segments of the Signal Strength and Frequency bar graphs will fluctuate as network data signals are received. In addition, the speaker will make a rushing "hiss" sound (representing background radio noise) with rapid "bleep" sounds (similar to the sound of cricket chirring) intermixed. The "bleeps" represent modulated network data. Set the VOLUME control for a comfortable listening level.

5. **With the RANGE switch set to the HIGH position, move the FAST Tool** to various antenna mounting locations, listening for network data signal "bleeps", and observing the signal strength readings at each location. To audibly distinguish network data signals, be aware that "on channel" signals will make "bleeping" sounds, while "off channel" signals, though reducing the background noise, will have the "bleeps" conspicuously missing. Find the areas that give the highest signal strength readings according to the following chart:

HIGH RANGE CALIBRATION

LIT BARS	dBm	SIGNAL STRENGTH
2-3	-114 to -106	Weak signal reception
4-6	-98 to -82	Acceptable reception
7-10	-74 to -50	Good reception

***IMPORTANT!:** When observing signal strength readings, be sure that only those signals lighting the center segments on the FREQUENCY bar graph ("on channel" signals) are used in determining optimum antenna locations. Refer to the FREQUENCY DISPLAY paragraph for more information.*

6. **If only low readings can be found using the HIGH range, set the RANGE switch to the LOW position** and check the signal strength readings at each location again, using the following chart as a guide:

LOW RANGE CALIBRATION

LIT BARS	dBm	SIGNAL STRENGTH
2-5	-117 to -105	Weak signal reception
6-9	-101 to -89	Acceptable reception
10	-85	Preferable reception

Installer judgment should be used when determining the best antenna locations. Since these readings are real-time measurements, a high reading does not necessarily mean communication will always be good at any one particular site. To get a better indication of radio activity, allow an appropriate amount of time for viewing at each location (20-30 seconds for Private Systems and up to two minutes for AlarmNet users).

7. **Mount the antenna at the location that consistently gives the highest readings.**

***IMPORTANT!:** While high signal strength readings are important for proper communication in all Radio installations, readings of seven (7) or higher are vital for two-way, polled Radios (ex. 7920SE Transceiver). Failure to achieve these readings can result in communication failures.*

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GENERAL NOTES ON RADIO INSTALLATION

The following information is provided to help ensure the dependability of radio communication with the Long Range Radio Network.

- Unless otherwise stated, the Radio must be mounted indoors, in an area where it will be undisturbed. To facilitate testing, the Radio should also be located in an easily accessible area.

- Avoid mounting the Radio in areas where temperature extremes will be encountered. Refer to the Radio's Installation Instructions for permissible temperature ranges. Preferably, the mounting site environment should be climate controlled.

- Though the Radio must be mounted indoors, the antenna can usually be mounted indoors or outdoors by the use of 50 ohm coaxial cable available from Ademco. To avoid signal loss through attenuation when mounting the antenna remotely, cable lengths should be 50 feet or less. Use *only* the cables listed in the following table:

Ademco Part No.	Cable Length
7626-5	5 feet
7626-12	12 feet
7626-25	25 feet
7626-50	50 feet

To ensure the integrity of the security system, DO NOT assemble your own extension cables.

***IMPORTANT!:** Many Ademco Radios feature antenna supervision circuitry, which triggers an alarm if tampering of the antenna or antenna cable occurs. Note that while cable lengths of up to 50 feet are acceptable for communication purposes, cable lengths over 20 feet can pose problems for the antenna supervision circuitry, and possibly provide false indication that an antenna is connected, when in fact it has been removed or tampered with.*

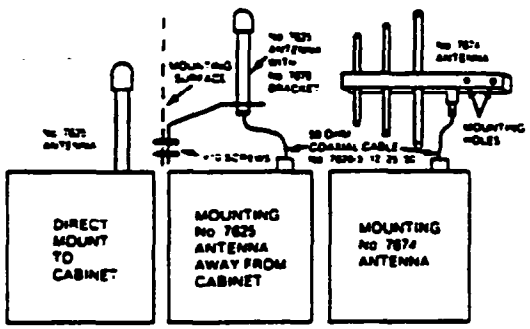
- When mounting the antenna, avoid obstructions such as metal ducts, pipes, foil backed insulation, etc. as these will adversely affect transmission.

- To avoid interference, the antenna should be mounted as as far as possible from sources of RFI interference and other electronic equipment, whose operation might be affected by the RF energy radiated by the Radio. Vertical separation is more important than horizontal separation, as signal radiation is strongest in the horizontal plane. The following minimum distances are suggested:

EQUIPMENT	DISTANCE
No. 5600/5700 Receivers	20 feet
Passive Infrared Devices	10 feet
Control/Communicator	25 feet
FM & TV Antenna	25 feet
Other Equipment	Never less than 10 feet

- Strong signal strength indications at the antenna location are vital for dependable communication with the Long Range Radio Network. In the event that acceptable signal strength readings cannot be achieved using the standard No. 7625 antenna, the optional No. 7625-3dB high gain or No. 7674 YAGI antenna can be used. The No. 7625-3dB antenna adds about 3dB gain when compared to the standard No. 7625 antenna, and can be mounted in exactly the same manner as the No. 7625. The No. 7674 antenna provides directional characteristics and mounts remotely.

  The No. 7674 antenna must be aimed in the direction which gives the strongest signal strength indications and mounts with screws through its main section. Connect the antenna to the Radio using the shortest of the available cables.



RECHARGING THE BATTERY

The battery condition should be checked before using the FAST Tool (by depressing the BATT TEST pushbutton and observing the BATTERY display). If the lighted LED segment is in the bracketed "RECHARGE" area, the battery must be recharged.

To recharge the battery, simply plug the supplied transformer into a 120VAC, 60Hz wall receptacle. Allow at least four (4) hours of recharging time, or at least until the LED segment lights in the "GOOD" bracketed area. Note that the FAST Tool can be used while the transformer is plugged in, but that installer movement is limited to the length of the line cord.

SPECIFICATIONS

Size:	10" X 7 1/2" X 2 3/8"
Power:	12VDC, 0.8AH sealed lead acid battery, 3 hours continuous use from full charge.
Recharge Rate:	8 hours for fully depleted battery
Weight:	3lbs
RF Frequency:	952.0125MHz to 952.3375MHz
Sensitivity:	-116dBm minimum for 12dB sinad
Operating Temp:	32°F to 120°F (0°C to 50°C)
Storage Temp:	-4°F to 140°F (-20°C to 60°C)

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